

# **DEFENSE INFORMATION SYSTEMS AGENCY**

JOINT INTEROPERABILITY TEST COMMAND 2001 BRAINARD ROAD FORT HUACHUCA, ARIZONA 85613-7051

IN REPLY

Networks, Transmission and Integration Division (JTE)

17 October 2003

# MEMORANDUM FOR DISTRIBUTION

SUBJECT: Joint Interoperability Test Certification of Avaya MultiVantage S8700,

DEFINITY G3R and G3SI Digital Switching Systems with Software

Release R011.7585.7.0.2

References: (a) DOD Directive 4630.5, "Interoperability and Supportability of

Information Technology (IT) and National Security Systems

(NSS)," 11 January 2002

(b) CJCSI 6212.01B, "Interoperability and Supportability of National

Security Systems and Information Technology Systems," 8 May

2000

1. References (a) and (b) establish the Defense Information Systems Agency (DISA), Joint Interoperability Test Command (JITC), as the responsible organization for interoperability test certification. Additional references are provided in enclosure 1.

- 2. The Avaya MultiVantage S8700 Digital Switching System with Software Release R011x.7585.7.0.2, hereafter referred to as the system under test (SUT), meets all of its critical interoperability requirements, and is certified as interoperable for joint use within the Defense Switched Network (DSN). The identified test discrepancies shown in enclosure 2 that remained open after software patches were applied and regression testing was completed have an overall minor operational impact. The Avaya DEFINITY G3R and G3SI digital switching systems employ the same software and trunk/line card hardware as the SUT; JITC analysis determined the G3R and G3SI to be functionally identical for interoperability certification purposes. The switching systems and their respective software releases covered under this certification are listed in table 1. The SUT was tested and met the critical interoperability requirements for the following DSN switch types: Small End Office, Private Branch Exchange (PBX) 1 and PBX 2. This certification expires upon changes that could affect interoperability, but no later than three years from the date of this memorandum.
- 3. This finding is based on interoperability testing conducted by the JITC. Testing was conducted at the JITC facility at Ft. Huachuca, AZ. The Certification Testing Summary (enclosure 2) documents the test results and describes the tested network and systems

configurations. System interoperability should be verified before deployment in an operational environment that varies significantly from the test environment.

- 4. The interoperability summary of the SUT is indicated in table 2. The interoperability status and criticality are listed in table 3, and the Exchange Requirements (ERs) and Functional Requirements (FRs) for the DSN are listed in table 4. The Avaya switch product line offers a Remote Switch Unit capability referred to as the Survivable Remote Processor Expansion Port Network. This product line also offers a Voice over Internet Protocol capability. Preliminary testing was performed on these capabilities, but neither is covered by this certification. Network Management (NM) capabilities of the SUT platform were tested in accordance with the DISA NS53 requirements as set forth in references (c) and (d). This reference requires that a switch provide NM capabilities via either ethernet, serial (EIA-232), or serial (X.25 or BX.25 variant). The SUT meets the NM requirements through the use of either serial (EIA-232) or Ethernet connections. The serial interface does not support alarm data. This interoperability test status is based upon evaluation of:
- a. The following network interfaces as specified in reference (e): DSN, Defense Red Switch Network Gateway, Tactical Network Gateway, North Atlantic Treaty Organization Gateway, and Public Switched Telecommunications Network or Commercial Network Gateway.
- b. The interface and signaling requirements for trunk/line interfaces, and interoperability ERs and FRs derived from references (f) and (g).
- c. The overall system interoperability performance derived from test procedures listed in reference (h).
  - d. Review of Letters of Compliance submitted by Avaya.

Table 1. Certified Avaya DEFINITY Software Releases

Software Release	Software Medium	Switch Platform
R011x.7585.7.0.2 (See note)	Optical Disk	MultiVantage S8700
R011r.7585.7.0.2 (See note)	Optical Disk	DEFINITY G3R
R011i.7585.7.0.2 (See note)	PCMCIA	DEFINITY G3SI
Legend:		

PCMCIA – Personal Computer Memory Card International Association

Note:

The software is the same; however, Avaya distinguishes the different mediums and platforms by the 5th character of the Software Release (e.g. x, r, i)

Table 2. MultiVantage S8700, DEFINITY G3R and G3SI Digital Switching Systems Interoperability Summary

Network	Critical	Status	Remarks
DSN	Yes	Certified	- VoIP not certified  - Certified as SMEO & PBX1  - RSU not certified  - E1 CAS and CDC certified (DISN-E only)  - The identified test discrepancies shown in enclosure (2) that remained open have an overall minor operational impact.
DRSN Gateway	Yes	Certified	- All critical requirements met
Tactical Gateway	No	Certified	- All critical requirements met
NATO Gateway	No	Not Tested	
Commercial Gateway	Yes	Certified	- All critical requirements met
CAS - Channel Associated Signaling CDC - Common Data Channel DISN-E - Defense Information System Netwo DRSN - Defense Red Switch Network DSN - Defense Switched Network E1 - European Basic Rate (2.048 Mbps)	ork Europe		Mbps - Megabits per second NATO - North Atlantic Treaty Organization PBX1 - Private Branch Exchange 1 RSU - Remote Switching Unit SMEO - Small End Office VoIP - Voice over Internet Protocol

**Table 3. Interoperability Status** 

	Trunk Interfaces						
	Interface & Signaling	Critical	Status	Remarks			
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	Certified	Met all critical ERs and FRs.			
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	Yes	Certified	Met all critical ERs and FRs.			
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	Yes	Certified	Met all critical ERs and FRs.			
	PCM-30 E1 CAS HDB3 MFR1	No	Certified	Met all ERs and FRs.			
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Full compliance to the ANSI T1.619a requirement not met.   Operational impact is minor.			
	Analog E&M Signaling Type I	No	Certified	Met all ERs and FRs.			
		Line I	nterfaces				
	Interface & Signaling	Critical	Status	Remarks			
Defense Switched Network	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. ISDN Supplemental Services <sup>2</sup> and full compliance of DSN Announcements <sup>3</sup> not met. Operational impact is minor.			
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Full compliance of DSN Announcements <sup>3</sup> not met. Operational impact is minor.			
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all ERs and FRs except for full compliance of DSN Announcements. <sup>3</sup> Operational impact is minor.			
	Network Management Interfaces						
	Interface & Signaling	Critical	Status	Remarks			
	CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	No	Certified	Met all ERs and FRs.			
	TPC EIA232 Asynchronous @ 9.6 kbps	No	Certified	Met all ERs and FRs.			
	TPC X.25 or BX.25 Synchronous	No	Not Tested				

Table 3. Interoperability Status (continued)

<b>Defense Red</b>	Trunk Interfaces						
Switch	Interface & Signaling	Critical	Status	Remarks			
Network Gateway	2-Wire Analog Loop	Yes	Certified	Met all critical ERs and FRs.			
	Trunk Interfaces						
	Interface & Signaling	Critical	Status	Remarks			
Tactical	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	No	Certified	Met all ERs and FRs.			
Network	PCM-30 E1 HDB3 CAS MFR1	No	Certified	Met all ERs and FRs.			
Gateway	Analog E&M Signaling Type I	No	Certified	Met all ERs and FRs.			
NIATEO	7.	Trunk In	terfaces				
NATO	Interface & Signaling	Critical	Status	Remarks			
Gateway		No	Not Tested				
Commercial	Trunk Interfaces						
Network	Interface & Signaling	Critical	Status	Remarks			
Gateway	Same Interfaces and Signaling as DSN	Yes	Certified	See note 4.			
AMI - Alternate M ANSI - American N B8ZS - Bipolar Eig BRI - Basic Rate CAS - Channel As CAT - Category DISN - Dial Pulse DSN - Defense Sw DTMF - Dual Tone: EI - European B E&M - Ear and Mo EIA - Electronic I ERs - Exchange F ESF - Extended S FRs - Functional	iornation Systems Network  vitched Network  Multi-Frequency Basic Rate (2.048 Mbps)  buth Industries Alliance  kequirements	HDB3	Integrated Services Dip kilobits per second Megabits per second Multi-Frequency R1 North Atlantic Treaty Pulse Code Modulatio Pulse Code Modulatio Primary Rate Interface Superframe ISDN BRI Four-Wire System Under Test Digital Transmission I	Three nd Electronic Engineering Inc. gital Network  Organization n 24 Channels n 30 Channels  Interface  Link level 1 (1.544 Mbps) Protocol/Internet Protocol			

- The SUT will not allow calls between unlike DSN service domains when resources are available. The SUT meets the minimum requirements defined in reference (g), and full compliance

- The SOT with four allow can't be obetween unified DSN service domains when resources are available. The SOT meets the minimum requirements defined in reference (g), and this compliance is not required until Oct 2003. The operational impact is minor.

  ISDN Supplemental Services currently not used in the DISN. The operational impact is none.

  Met all DSN Announcement requirements except for Isolation Code Announcement. The SUT provides this announcement only for precedence calls above ROUTINE. ROUTINE precedence calls receive a fast busy signal.

  The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "View items listed in appendix E of the GSTP specified in tables 2-1 through 2-15 of the GSCR.

**Table 4. Exchange and Functional Requirements** 

		Trunk Interfaces	
	Interface & Signaling	Exchange & Functional Requirements	
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	- MLPP - Hotline Services	
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	System Interface     Non-secure Voice and Data     Secure Voice and Data (STU-III and STE)	
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	NX56 kbps and NX64 kbps Synchronous Data     Non-secure and Secure FAX	
	PCM-30 E1 CAS HDB3 MFR1	• VTC • Alarms	
	PCM-24 T1 B8ZS/ESF ISDN PRI	Integrated Services Digital Network     (ISDN PRI only)     Attendant Services <sup>1</sup>	
	Analog E&M Signaling Type I	- System Administration, Measurements, and Service Standards - Y2K (Rollover, Valid and Invalid Dates) - Screening, Zone Restriction, and DSN Access Restriction - Automated Message Accounting - Network Integration - Common Data Channel (T1 and E1 CAS only) - ANSI T1.619a (T1 ISDN PRI)	
5.0	Line Interfaces		
Defense Switched	Interface & Signaling	Exchange & Functional Requirements	
Network	TPC ISDN BRI ST and U Interface Q.931	<ul> <li>MLPP</li> <li>Hotline Services</li> <li>ANSI T1.619a</li> <li>ISDN Supplemental Services</li> <li>Call Treatments</li> <li>DSN Announcements</li> <li>Attendant Services<sup>1</sup></li> <li>EKTS</li> <li>VTC</li> <li>NX56 kbps and NX64 kbps Synchronous Data</li> <li>Non-secure Voice and Data</li> <li>Secure Voice and Data (STE)</li> </ul>	
	TPC 2-Wire analog	<ul> <li>MLPP</li> <li>Hotline Services</li> <li>DSN Announcements</li> <li>Traffic Measurements</li> <li>Attendant Services<sup>1</sup></li> <li>Call Treatments</li> <li>Non-secure Voice and Data</li> <li>Non-secure and Secure FAX</li> <li>Secure Voice and Data (STU-III and STE)</li> </ul>	
	TPC 2-Wire Digital and Analog (Proprietary)	<ul> <li>MLPP</li> <li>Hotline Services</li> <li>DSN Announcements</li> <li>Traffic Measurements</li> <li>Attendant Services<sup>1</sup></li> <li>Call Treatments</li> <li>Non-secure Voice</li> </ul>	

**Table 4. Exchange and Functional Requirements (continued)** 

Defense Switched Network   CAT 5 TPC IEEE 802.3 10BascT   Etherent Sweather CPCPIP   TPC ELA232 Asynchronous @ 9.6 kbps   - Automated Message Accounting   - Traffic Measurements   - Alarms (TCPIP Interface only)   - Man Machine Language   - Machine Language   - Man Mac	Switched   CAT 5 TPC IEEE 802.3 10BascT   Ethernet, TCPIP   Ethernet, TCPIP   Trunk Interface only   Allower   Ethernet, TCPIP   Secure Voice (STU-III & STE)		Net	twork Management Interfaces
Network (continued)   TPC EIA233 Asynchronous @	Network (continued)   TPC ELG232 Asynchronous @ 9.6 kbps   Alarms (TCPIP interface only)   Alarm (TCPIP interface only)   Alarm (TCPIP interface only)   Alarm Anchine Language			
Continued   TPC EIA232 Asynchronous @   9.6 kbps   Man Machine Language   Machi	Continued   TPC EIA232 Asynchronous @ 9.6 kbps		CAT 5 TPC IEEE 802.3 10BaseT	- Automated Message Accounting
Defense Red Switch Network Gateway  TPC 2-Wire analog  Trunk Interfaces  Interface & Signaling PCM-24 TI (BRZS/ESF) (AMUSF) CAS MFRI Analog E&M Signaling Type I  NATO Gateway  NATO Gateway  Trunk Interfaces  Trunk Interfaces  Trunk Interfaces  Trunk Interfaces  Trunk Interfaces  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  Not tested  Trunk Interfaces  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 4.  Interface & Signaling Exchange & Functional Requirements  See note 6.  Interface & Signaling Exchange & Functional Requirements  See note 6.  Interface & Signaling Exchange & Functional Requirements  See note 6.  Interface & Signaling Exchange & Functional Requirements  See note 6.  Interface & Signaling Exchange & Functional Requirements  See note 6.  Interface & Signaling Exchange & Functional Requirements  See note 6.  Interface & Signaling Exchange & Functional Requirements  See note 6.  Interface & Signaling Exchange &	Defense Red Switch Network Gateway  Tactical Network Gateway  Tactical Network Gateway  Tactical Network Gateway  Trunk Interfaces  Interface & Signaling FCM-24 TI (BSZS/ESF) (AMUSF) CAS MFR1 Analog E&M Signaling Type I  Trunk Interfaces  Interface & Signaling FCM-24 TI (BSZS/ESF) (AMUSF) CAS MFR1 Analog E&M Signaling Type I  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  Not tested  Trunk Interfaces  Interface & Signaling See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Illustration of the Market Interface  Interface & Signaling Same Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Illustration of the Market Interface  Interface & Signaling Same Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Illustration of the Market Interface  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Si		Ethernet, TCP/IP	
Trunk Interfaces   Red   Switch   Swi	Trunk Interfaces   Trunk Interfaces   Signaling   Exchange & Functional Requirements	(continued)		
Red Switch Network Gateway  TPC 2-Wire analog  Trunk Interfaces  Interface & Signaling  PCM-24 TI (B8ZS/ESF) (AMI/SF) CAS MFRI  Analog E&M Signaling Type I  NATO Gateway  Not tested  Trunk Interfaces  Interface & Signaling Type I  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling ANNI - American National Standards Institute BIAL - Basic Rate Interface CAT - Change I Eight Zero Substitution MFRI - Multi-evel Precedence and Preemption NATO - North Atlantic Tevel Organization NATO - North Atlantic	Red Switch Network Gateway  TPC 2-Wire analog  Tactical Network Gateway  Trunk Interfaces  Interface & Signaling PCM-24 TI (B8ZS/ESF) (AMISF) CAS MFRI Analog E&M Signaling Type I  NATO Gateway  NATO Gateway  Not tested  Trunk Interfaces  Interface & Signaling Type I  Nanding E&M Signaling Type I  Non-secure Voice  Trunk Interfaces  Interface & Signaling Type I  Non-secure Voice  Non-secure Voice  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Illustration of the Signaling of the Signali		9.6 kbps	
Trunk Interfaces	Trunk Interfaces	Defense		Trunk Interfaces
Trunk Interface   Trunk Interfaces	Trunk Interfaces	Red	Interface & Signaling	Exchange & Functional Requirements
Tactical Network Gateway  Tactical Network Gateway  NATO Gateway  NATO Gateway  Trunk Interface & Signaling Exchange & Functional Requirements  Trunk Interfaces  Trunk Interfaces  MLPP  Non-secure Voice  Nation Exchange & Functional Requirements  Trunk Interfaces  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  Not tested See note 2.  Trunk Interfaces  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  Same Interface & Signaling Exchange & Functional Requirements  Same Interface & Signaling Exchange & Functional Requirements  Same Interface & Signaling Exchange & Functional Requirements  Network Gateway  Same Interface & Signaling Exchange & Functional Requirements  Same Interface & Signaling Excha	Tactical Network Gateway  The Cas MFRI Analog E& Signaling Exchange & Functional Requirements  PCM-24 TI (B8ZS/ESF) (AMI/SF) CAS MFRI Analog E&M Signaling Type I  NATO Gateway  Not tested See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  Not tested See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  Not tested See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  Not tested See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  Same Interface & Signaling Exchange & Functional Requirements  Same Interface & Signaling Exchange & Functional Requirements  Same Interface & Signaling Beach See note 3.  Legent:  Legent:  Legent:  Legent:  Legent:  AMI - Alternate Mark Inversion  AMI - Anternate Mark Inversion  AMI - Alternate Mark Inversion  AMI - Anternate Mark Inversion  Maps - Megabais per second  Maps	Switch		
Trunk Interfaces   Interface & Signaling   Exchange & Functional Requirements	Trunk Interfaces		TDC 2 Wire analog	
Tactical Network Gateway  PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1  Analog E&M Signaling Type 1  Trunk Interfaces  Non-secure Voice  Natro Gateway  Not tested  Trunk Interfaces  Trunk Interfaces  Trunk Interfaces  See note 2.  Trunk Interfaces  Interface & Signaling Type 1  Trunk Interfaces  Trunk Interfaces  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: IOBasel' - Ethernet Based Operation, Twisted Pair AMI - Alternate Mark Inversion	Tactical Network Gateway  PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1  Analog E&M Signaling Type 1  NATO Gateway  Not tested  Trunk Interfaces  Interface & Signaling Type 1  Trunk Interfaces  Trunk Interfaces  Interface & Signaling Type 1  Trunk Interfaces  Interface & Signaling Not tested  Exchange & Functional Requirements See note 2.  Trunk Interfaces  Interface & Signaling Not tested  Exchange & Functional Requirements See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements See note 2.  Trunk Interfaces  Interface & Signaling All Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling All Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling Exchange & Functional Requirements  See note 2.  Interface & Signaling Exchange & Functional Requirements  Interface & Signaling Exchange & Functional Requirements  Interfaces  Interface & Signaling Exchange & Functional Requirements  Interface & Signaling Exchange & Functional Re		TPC 2-wife analog	- Secure Voice (STU-III & STE)
Tactical Network Gateway  PCM-24 TI (B8ZS/ESF) (AMI/SF) CAS MFRI Analog E&M Signaling Type I  Trunk Interfaces  Interface & Signaling Type I  Trunk Interfaces  Interface & Signaling Type I  Trunk Interfaces  Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  National Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend:	Tactical Network Gateway  PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1  Analog E&M Signaling Type 1  NATO Gateway  NATO Gateway  NATO Gateway  Not tested  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legent:  Network Gateway  Same Interfaces and Signaling as DSN  See note 3.  Legent:  NAMI - Alternate Mark Inversion  AMI - Alternate Mark Inversion  AMI - Alternate Mark Inversion  MEPP - Multi-Frequency RI  MFRI - Multi-Frequency RI  MFRI - State Interface  CAS - Channel Associated Signaling  NATO - North Atlantic Treaty Organization  NATO - North Atlantic Treaty Organization  NATO - North Atlantic Treaty Organization  NATO - Data format restricted to multiples of 56K  NAS6 - Data format restricted to multiples o	Guteway		
PCM-24 T1 (B8ZS/ESF) (AMI/SF)   CAS MFR1   PCM-30 E1 HDB3 CAS MFR1   Non-secure Voice	PCM-24 T1 (B8ZS/ESF) (AMI/SF)   CAS MFR1   - MLPP   Non-secure Voice			
Network Gateway	Nato   Gateway   PCM-30 E1 HDB3 CAS MFR1   Analog E&M Signaling Type 1   Trunk Interfaces	Tastical	Interface & Signaling	Exchange & Functional Requirements
Commercial Network   Same Interface & Signaling   Exchange & Functional Requirements	Commercial Network Gateway			
Analog E&M Signaling Type I  Trunk Interfaces  Interface & Signaling Not tested  Trunk Interfaces  See note 2.  Trunk Interfaces  Interface & Signaling Not tested  Trunk Interfaces  Interface & Signaling See note 2.  Trunk Interfaces  Interface & Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface & Signaling Same Interfaces and Signaling as DSN  Legend: Interface & Signaling Same Interface Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface Signaling Exchange & Functional Requirements  See note 3.  Legend: Interface Signaling Exchange & Functional Requirements  Interfaces Interfac	NATO Gateway  Trunk Interfaces  Interface & Signaling  Not tested  See note 2.  Trunk Interfaces  Interface & Signaling  Exchange & Functional Requirements  See note 2.  Trunk Interfaces  Interface & Signaling  Exchange & Functional Requirements  Same Interface & Signaling  Exchange & Functional Requirements  Same Interface & Signaling  Exchange & Functional Requirements  Same Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  See note 3.  Legend:  Interface & Signaling  Exchange & Functional Requirements  Mps - kilobits per second  Mbps - Megabits per second  Mps - Megabits per s			
NATO Gateway    Trunk Interfaces   Signaling   Exchange & Functional Requirements	NATO Gateway	Gateway		- Non-secure voice
NATO Gateway	NATO Gateway			
Interface & Signaling   Exchange & Functional Requirements	Interface & Signaling   Exchange & Functional Requirements		туре т	Trunk Interfaces
Commercial Network   Interface & Signaling   Exchange & Functional Requirements	Commercial Network   Interface & Signaling   Exchange & Functional Requirements	NATO	Interface & Signaling	
Commercial Network   Same Interface & Signaling   Exchange & Functional Requirements	Commercial Network   Same Interface & Signaling   Exchange & Functional Requirements	Gateway		<del> </del>
Interface & Signaling   Exchange & Functional Requirements	Interface & Signaling   Exchange & Functional Requirements		Not tested	
Cateway   Same Interfaces and Signaling as DSN   See note 3.	Cateway   Same Interfaces and Signaling as DSN   See note 3.	Commercial	I.4	
Legend:	Legend:	Network	Interface & Signaling	Exchange & Functional Requirements
10BaseT - Ethernet Based Operation, Twisted Pair       kbps       -kilobits per second         AMI - Alternate Mark Inversion       Mbps       -Megabits per second         ANSI - American National Standards Institute       MFRI - MILIF-requency RI         B8ZS - Bipolar Eight Zero Substitution       MLPP - Multi-Level Precedence and Preemption         BRI - Basic Rate Interface       NATO - North Atlantic Treaty Organization         CAS - Channel Associated Signaling       NX56 - Data format restricted to multiples of 56K         CAT - Category       NX64 - Data format restricted to multiples of 64K         DP - Dial Pulse       PCM-24 - Pulse Code Modulation 24 Channels         DSN - Defense Switched Network       PCM-30 - Pulse Code Modulation 30 Channels         DTMF - Dual Tone Multi-Frequency       PRI - Primary Rate Interface         E1 - European Basic Multiplex Rate (2.048 Mbps)       SF - Superframe         E2M - Ear and Mouth       ST - ISDN BRI Four-Wire Interface         EKTS - Electronic Industries Alliance       STE - Secure Terminal Equipment         EKTS - Extended Superframe       STU-III - Secure Telephone Unit-III         FSF - Extended Superframe       T1 - Digital Transmission Link level 1 (1.544 Mbps)         GSCR - Generic Switch Test Plan       TPC - Twisted Pair Copper         HDB3 - High Density Bi-polar Three       U - ISDN BRI Two-Wire Interface <t< td=""><td>10BaseT - Ethernet Based Operation, Twisted Pair       kbps       -kilobits per second         AMI       - Alternate Mark Inversion       Mbps       - Megabits per second         AMI       - Alternate Mark Inversion       MFRI       - Multi-Frequency R1         BK2S       - Bipolar Eight Zero Substitution       MLPP       - Multi-Level Precedence and Preemption         BRI       - Basic Rate Interface       NATO       - North Atlantic Treaty Organization         CAS       - Channel Associated Signaling       NX56       - Data format restricted to multiples of 56K         CAT       - Category       NX64       - Data format restricted to multiples of 64K         DP       - Dial Pulse       PCM-24       - Pulse Code Modulation 24 Channels         DFMF       - Dual Tone Multi-Frequency       PCM-30       - Pulse Code Modulation 30 Channels         DTMF       - Dual Tone Multi-Frequency       PCM-30       - Pulse Code Modulation 30 Channels         E1       - Eucropean Basic Multiplex Rate (2.048 Mbps)       SF       - Superframe         EA       - Electronic Industries Alliance       ST       - Superframe         EKT       - Electronic Key Telephone Service       STU-III       - Secure Telephone Unit-III         FAX       - Facsimile       TI       - Digital Transmission Cnitrol Protocol/Int</td><td>Gateway</td><td>Same Interfaces and Signaling as DSN</td><td>See note 3.</td></t<>	10BaseT - Ethernet Based Operation, Twisted Pair       kbps       -kilobits per second         AMI       - Alternate Mark Inversion       Mbps       - Megabits per second         AMI       - Alternate Mark Inversion       MFRI       - Multi-Frequency R1         BK2S       - Bipolar Eight Zero Substitution       MLPP       - Multi-Level Precedence and Preemption         BRI       - Basic Rate Interface       NATO       - North Atlantic Treaty Organization         CAS       - Channel Associated Signaling       NX56       - Data format restricted to multiples of 56K         CAT       - Category       NX64       - Data format restricted to multiples of 64K         DP       - Dial Pulse       PCM-24       - Pulse Code Modulation 24 Channels         DFMF       - Dual Tone Multi-Frequency       PCM-30       - Pulse Code Modulation 30 Channels         DTMF       - Dual Tone Multi-Frequency       PCM-30       - Pulse Code Modulation 30 Channels         E1       - Eucropean Basic Multiplex Rate (2.048 Mbps)       SF       - Superframe         EA       - Electronic Industries Alliance       ST       - Superframe         EKT       - Electronic Key Telephone Service       STU-III       - Secure Telephone Unit-III         FAX       - Facsimile       TI       - Digital Transmission Cnitrol Protocol/Int	Gateway	Same Interfaces and Signaling as DSN	See note 3.
IOBaseT - Ethernet Based Operation, Twisted Pair       kbps       -kilobits per second         AMI - Alternate Mark Inversion       Mbps       -Megabits per second         AMSI - American National Standards Institute       MFRI - Multi-Frequency R1         B8ZS - Bipolar Eight Zero Substitution       MLPP - Multi-Level Precedence and Preemption         BRI - Basic Rate Interface       NATO - North Atlantic Treaty Organization         CAS - Channel Associated Signaling       NX56 - Data format restricted to multiples of 56K         CAT - Category       NX64 - Data format restricted to multiples of 64K         DP - Dial Pulse       PCM-24 - Pulse Code Modulation 24 Channels         DSN - Defense Switched Network       PCM-30 - Pulse Code Modulation 30 Channels         DTMF - Dual Tone Multi-Frequency       PRI - Primary Rate Interface         E1 - European Basic Multiplex Rate (2.048 Mbps)       SF - Superframe         ELA - Electronic Industries Alliance       ST - ISDN BRI Four-Wire Interface         EKTS - Electronic Key Telephone Service       STU-III - Secure Telephone Unit-III         EKTS - Extended Superframe       SUT - System Under Test         FAX - Facsimile       T1 - Digital Transmission Link level 1 (1.544 Mbps)         GSCR - Generic Switching Center Requirements       TCP/IP - Transmission Control Protocol/Internet Protocol         GSTP - Generic Switch Test Plan       TPC - Twisted Pair Co	10BaseT - Ethernet Based Operation, Twisted Pair       kbps       -kilobits per second         AMI       - Alternate Mark Inversion       Mbps       - Megabits per second         AMI       - Alternate Mark Inversion       MFRI       - Multi-Frequency RI         BK2S       - Bipolar Eight Zero Substitution       MLPP       - Multi-Level Precedence and Preemption         BRI       - Basic Rate Interface       NATO       - North Atlantic Treaty Organization         CAS       - Channel Associated Signaling       NX56       - Data format restricted to multiples of 56K         CAT       - Category       NX64       - Data format restricted to multiples of 64K         DP       - Dial Pulse       PCM-24       - Pulse Code Modulation 24 Channels         DFMF       - Dual Tone Multi-Frequency       PCM-30       - Pulse Code Modulation 30 Channels         DTMF       - Dual Tone Multi-Frequency       PCM-30       - Pulse Code Modulation 30 Channels         E1       - European Basic Multiplex Rate (2.048 Mbps)       SF       - Superframe         E1       - Electronic Industries Alliance       ST       - Superframe         EKT       - Electronic Key Telephone Service       STU-III       - Secure Telephone Unit-III         EKT       - Extended Superframe       ST       - System Under Test	Legend:		
ANSI - American National Standards Institute  B8ZS - Bipolar Eight Zero Substitution  MIPP - Multi-Level Precedence and Preemption  NATO - North Atlantic Treaty Organization  CAS - Channel Associated Signaling  CAT - Category - NX64 - Data format restricted to multiples of 56K  CAT - Category - NX64 - Data format restricted to multiples of 64K  DP - Dial Pulse  DB - Dial Pulse  DE - Dual Tone Multi-Frequency - PCM-30 - Pulse Code Modulation 34 Channels  DTMF - Dual Tone Multi-Frequency - PRI - Primary Rate Interface  E&M - Ear and Mouth - ST - ISDN BRI Four-Wire Interface  EKTS - Electronic Industries Alliance - STE - Secure Telephone Unit-III  EKTS - Extended Superframe  SUT - System Under Test  FAX - Facsimile - TI - Digital Transmission Link level 1 (1.544 Mbps)  GSCR - Generic Switching Center Requirements  GSCP - Generic Switch Test Plan - TPC - Twisted Pair Copper  HDB3 - High Density Bi-polar Three  IEEE - Institute of Electronic Engineering Inc VTC - Video Teleconferencing  Notes:	ANSI - American National Standards Institute  BZS - Bipolar Eight Zero Substitution  BZS - Bipolar Eight Zero Substitution  ANTO - Multi-Evel Precedence and Preemption  NATO - North Atlantic Treaty Organization  ANSI - Basic Rate Interface  CAS - Channel Associated Signaling  CAS - Superfame  CAS - Super Interface  CAS - Superfame  CAS - Super	10BaseT - Ethernet Based		kbps -kilobits per second
BBZS - Bipolar Eight Zero Substitution MLPP - Multi-Level Precedence and Preemption BRI - Basic Rate Interface NATO - North Atlantic Treaty Organization CAS - Channel Associated Signaling NX56 - Data format restricted to multiples of 56K CAT - Category NX64 - Data format restricted to multiples of 64K DP - Dial Pulse - Defense Switched Network PCM-30 - Pulse Code Modulation 30 Channels DSN - Defense Switched Network PCM-30 - Pulse Code Modulation 30 Channels DTMF - Dual Tone Multi-Frequency PRI - Primary Rate Interface E1 - European Basic Multiplex Rate (2.048 Mbps) SF - Superframe E4 - Electronic Industries Alliance STE - Secure Terminal Equipment EKTS - Electronic Key Telephone Service STU-III - System Under Test EKTS - Estended Superframe EATH - System Under Test FAX - Facsimile GSCR - Generic Switching Center Requirements GSCP - Generic Switch Test Plan  T1 - Digital Transmission Link level 1 (1.544 Mbps)  GSCP - Generic Switch Test Plan  TPC//P - Twisted Pair Copper HDB3 - High Density Bi-polar Three  Institute of Electrical and Electronic Engineering Inc.  Notes:  WILD - Multi-Level Precedence and Preemption NATO - Noth Atlantic Treaty Organization CPCHP - Data format restricted to multiples of 56K - Data format restricted to multiples of 64K - PCM-30 - PUlse Code Modulation 30 Channels - PCM-30 - PUlse Code Modulation 30 Channels - PCM-30 - P	BBZS - Bipolar Eight Zero Substitution MLPP - Multi-Level Precedence and Preemption MATO - North Atlantic Treaty Organization CAS - Channel Associated Signaling NX56 - Data format restricted to multiples of 56K - Data format restricted to multiples of 64K - DP - Dial Pulse - Defense Switched Network - PCM-30 - Pulse Code Modulation 24 Channels - Defense Switched Network - PCM-30 - Pulse Code Modulation 30 Channels - DTMF - Dual Tone Multi-Frequency - PRI - European Basic Multiplex Rate (2.048 Mbps) - PRI - European Basic Multiplex Rate (2.048 Mbps) - ST - Superframe - ST - Superframe - ST - ISDN BRI Four-Wire Interface - Electronic Industries Alliance - ST - ST - ISDN BRI Four-Wire Interface - Extended Superframe - SUT - Secure Telephone Unit-III - Secure Telephone Unit-III - Supering - Supering - Supering - Supering - PAS - Superframe - SUT - Supering -			
CAS - Channel Associated Signaling NX56 - Data format restricted to multiples of 56K CAT - Category NX64 - Data format restricted to multiples of 64K - Puse Code Modulation 30 Channels - PCM-3 - Puse Code Modulation 30 Channels - PCM-30 - Puse Code	CAS -Channel Associated Signaling NX56 - Data format restricted to multiples of 56K CAT - Category NX64 - Data format restricted to multiples of 56K CAT - Category NX64 - Data format restricted to multiples of 64K Data format restricted to purples of 64K Data format restricted to multiples of 64K Data format restricted to purples of 64K Data format restricted to purples and bate for 66K Data format restricted to multiples of 64K Data format restricted to multiples of 64K Data format restricted to purples of 4K Data format restricted to purples of 94M Data format restricted to purples of 94M Data format restricted to multiples of 64K Data format purples of 94M Data			
CAT - Category	CAT Category NX64 - Data format restricted to multiples of 64K DP - Dial Pulse Ode Modulation 24 Channels DSN - Defense Switched Network PCM-30 - Pulse Code Modulation 30 Channels DTMF - Dual Tone Multi-Frequency PRI - Primary Rate Interface E1 - European Basic Multiplex Rate (2.048 Mbps) SF - Superframe E1 - Elactronic Industries Alliance ST - ISDN BRI Four-Wire Interface E1A - Electronic Industries Alliance ST - ST - ISDN BRI Four-Wire Interface E1A - Electronic key Telephone Service STU-III - Secure Telephone Unit-III EKTS - Extended Superframe EKTS - Extended Superframe SUT - System Under Test FAX - Facsimile TCP/IP - Transmission Link level I (1.544 Mbps) GSCR - Generic Switching Center Requirements GSCR - Generic Switch Test Plan TPC - Transmission Control Protocol/Internet Protocol HDB3 - High Density Bi-polar Three LEEE - Institute of Electrical and Electronic Engineering Inc. VTC - Video Teleconferencing Link Bervices Digital Network  Note: SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C. NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function.			
DP - Dial Pulse	DP Dial Pulse DP Dial Pulse DP Defense Switched Network DSN Defense Switched Network DSN Defense Switched Network DP PCM-30 Pulse Code Modulation 30 Channels DP Dial Tone Multi-Frequency PRI Primary Rate Interface E1 European Basic Multiplex Rate (2.048 Mbps) SF Superframe E&M -Ear and Mouth EEAT and Mouth EEAT -Electronic Industries Alliance EIA Electronic Key Telephone Service STE Secure Terminal Equipment EKTS -Electronic Key Telephone Service STU-III -Secure Telephone Unit-III ESF -Extended Superframe SUT -System Under Test FAX -Facsimile Generic Switching Center Requirements TCP/IP - Transmission Control Protocol/Internet Protocol GSTP -Generic Switch Test Plan HDB3 -High Density Bi-polar Three HDB3 -High Density Bi-polar Three Institute of Electrical and Electronic Engineering Inc. TCP/IP -Institute of Electrical and Electronic Engineering Inc. TCP/IP -Institute of Electronic Protocol/Internet Protocol STORUS - Vice - Vice - Vice - Peleconferencing TSDN - Integrated Services Digital Network  SUT - Resident Console Model 302C.  NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function.		ated Signating	
DTMF   Dual Tone Multi-Frequency   PRI   Primary Rate Interface   E1   European Basic Multiplex Rate (2.048 Mbps)   SF   Superframe   E1   Ear and Mouth   ST   ISDN BRI Four-Wire Interface   E1   Electronic Industries Alliance   STE   Secure Terminal Equipment   EKTS   Electronic Key Telephone Service   STU-III   Secure Telephone Unit-III   EKTS   Extended Superframe   SUT   System Under Test   EAR   Facsimile   TI   Digital Transmission Link level 1 (1.544 Mbps)   EKTS   Generic Switching Center Requirements   TCP/IP   Transmission Control Protocol/Internet Protocol   EKTS   Generic Switch Test Plan   TPC   Twisted Pair Copper   EKTS   High Density Bi-polar Three   U   ISDN BRI Two-Wire Interface   EKTS   Institute of Electrical and Electronic Engineering Inc.   VTC   Video Teleconferencing   EKTS   Vera 2000   EKTS	DTMF   Dual Tone Multi-Frequency   PRI   Primary Rate Interface   E1			
EI deronie Albaire Alaie (2.048 Mbps)  E&M - European Basic Multiplex Rate (2.048 Mbps)  E&M - Ear and Mouth ST - ISDN BRI Four-Wire Interface  EK - Ear and Mouth ST - Secure Terminal Equipment  EKT - Electronic Key Telephone Service  STU-II - Secure Telephone Unit-III  ESF - Extended Superframe  EX - Extended Superframe  SUT - System Under Test  - Digital Transmission Link level 1 (1.544 Mbps)  TCP/P - Transmission Control Protocol/Internet Protocol  GSCR - Generic Switching Center Requirements  TCP/P - Transmission Control Protocol/Internet Protocol  TPC - Twisted Pair Copper  HDB3 - High Density Bi-polar Three  Institute of Electrical and Electronic Engineering Inc.  VTC - Video Teleconferencing  Total - Video Teleconferencing  Total - Video Teleconferencing  VIC - Video Teleconferencing	EI de vorpean Basic Multiplex Rate (2.048 Mbps)  EA ar and Mouth  Electronic Industries Alliance  Electronic key Telephone Service  EKTS  Electronic key Telephone Service  EKTS  Extended Superframe  EKTS  Extended Superframe  STU  TI  Digital Transmission Link level 1 (1.544 Mbps)  TCP/IP  Transmission Control Protocol/Internet Protocol  EKTP  GSCR  Generic Switch Test Plan  HDB3  High Density Bi-polar Three  HDB3  High Density Bi-polar Three  Institute of Electrical and Electronic Engineering Inc.  TCP  TVC  VTC  VTC  VTC  VTC  Video Teleconferencing  Integrated Services Digital Network  Telectronic Hugh Bis and Electronic Engineering for attendant services with the following console: Lucent Attendant Console Model 302C.			
E&M     - Ear and Mouth     ST     - ISDN BRI Four-Wire Interface       EIA     - Electronic Industries Alliance     STE     - Secure Terminal Equipment       EKTS     - Electronic Key Telephone Service     STU-III     - Secure Telephone Unit-III       ESF     - Extended Superframe     SUT     - System Under Test       FAX     - Facsimile     T1     - Digital Transmission Link level 1 (1.544 Mbps)       GSCR     - Generic Switching Center Requirements     TC//PP     - Transmission Control Protocol/Internet Protocol       GSTP     - Generic Switch Test Plan     TPC     - Twisted Pair Copper       HDB3     - High Density Bi-polar Three     U     - ISDN BRI Two-Wire Interface       IEEE     - Institute of Electrical and Electronic Engineering Inc.     VTC     - Video Teleconferencing       SDN     - Integrated Services Digital Network     Y2K     - Year 2000	E&M       - Ear and Mouth       ST       - ISDN BRI Four-Wire Interface         EIA       - Electronic Industries Alliance       STE       - Secure Terminal Equipment         EKTS       - Electronic Key Telephone Service       STU-III       - Secure Terminal Equipment         ESF       - Extended Superframe       STU-III       - System Under Test         FAX       - Facsimile       Ti2       - Digital Transmission Link level 1 (1.544 Mbps)         GSCR       - Generic Switching Center Requirements       TCP/IP       - Transmission Control Protocol/Internet Protocol         GSTP       - Generic Switch Test Plan       TPC       - Twisted Pair Copper         HDB3       - High Density Bi-polar Three       UT       - ISDN BRI Two-Wire Interface         ISDN       - Integrated Services Digital Network       VTC       - Video Teleconferencing         ISDN       - Integrated Services Digital Network       Y2K       - Year 2000         SUT mets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C.         2 NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function.			
EKTS - Electronic Key Telephone Service STU-III - Secure Telephone Únit-III - Secure Telephone	EKTS - Electronic Key Telephone Service STU-III - Secure Telephone Unit-III - Secure T		Multiplex Rate (2.046 Mops)	
ESF     - Extended Superframe     SUT     - System Under Test       FAX     - Facsimile     T1     - Digital Transmission Link level 1 (1.544 Mbps)       GSCR     - Generic Switching Center Requirements     TCP/IP     - Transmission Control Protocol/Internet Protocol       GSTP     - Generic Switch Test Plan     TPC     - Twisted Pair Copper       HDB3     - High Density Bi-polar Three     U     - ISDN BRI Two-Wire Interface       IESD     - Institute of Electrical and Electronic Engineering Inc.     VTC     - Video Teleconferencing       Notes:     - Vaer 2000	ESF - Extended Superframe SUT - System Under Test - System Under Test - PAX - Facsimile - Topilar Transmission Link level 1 (1.544 Mbps) - Digital Transmission Link level 1 (1.544 Mbps) - Digital Transmission Control Protocol/Internet Protocol Topilar - Transmission Control Protocol/Internet Protocol Topilar - Topilar - Transmission Control Protocol/Internet Protocol Topilar - Topila			
FAX - Facsimile	FAX   Facsimile			
GSCR - Generic Switching Center Requirements TCP/IP - Transmission Control Protocol/Internet Protocol GSTP - Generic Switch Test Plan TPC - Twisted Pair Copper HDB3 - High Density Bi-polar Three U - ISDN BRI Two-Wire Interface -Institute of Electrical and Electronic Engineering Inc. VTC - Video Teleconferencing ISDN - Integrated Services Digital Network Y2K - Year 2000	GSCR Generic Switching Center Requirements GSTP Generic Switch Test Plan GSTP Generic Switch Test Plan HDB3 Generic Switch Test Plan HDB3 High Density Bi-polar Three HDB4 Institute of Electrical and Electronic Engineering Inc. HDB5 Intitute of Electrical and Electronic Engineering Inc. HDB6 Institute of Electrical and Electronic Engineering Inc. HDB7 VTC Video Teleconferencing HDB8 VTC Video Teleconferencing HDB9 VTC Video Teleconferencing		наше	
GSTP - Generic Switch Test Plan TPC - Twisted Pair Copper - ISDN BRI Two-Wire Interface - IsSN pair Legrated Services Digital Network Y2K - Y2K	GSTP - Generic Switch Test Plan		ng Center Requirements	TCP/IP - Transmission Control Protocol/Internet Protocol
IEEE     - Institute of Électrical and Electronic Engineering Inc.     VTC     - Video Teleconferencing       ISDN     - Integrated Services Digital Network     Y2K     - Year 2000    Notes:	IEEE   Institute of Électrical and Electronic Engineering Inc.   VTC   Video Teleconferencing   15DN   Integrated Services Digital Network   V2K   V	GSTP - Generic Switch	Test Plan	
ISDN - Integrated Services Digital Network Y2K - Year 2000  Notes:	ISDN   -Integrated Services Digital Network   Y2K   - Year 2000			
Notes:	Notes:  SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C.  NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function.			
	NATO interface requirements are in accordance with the GSCR paragraph 10.8. Not all switches are required to perform this function.	Notes:		
	The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and			

The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP specified in tables 2-1 through 2-15 of the GSCR.

(SIPRNET). Information related to DSN testing is on the Telecom Switched Services Interoperability (TSSI) website at <a href="http://jitc.fhu.disa.mil/tssi">http://jitc.fhu.disa.mil/tssi</a>.

6. The JITC point of contact is Mr. John Gese, DSN 879-5164 commercial (520) 538-5164, FAX DSN 879-4347 or e-mail to gesej@fhu.disa.mil.

2 Enclosures: LESLIE F. CLAUDIO

1 Additional References Chief

2 Certification Testing Summary Networks, Transmission and Integration Division

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Commander, Defense Information Systems Agency (DISA), ATTN: NS53 (Mr. Osman), Room 5w23, 5275 Leesburg Pike (RTE 7) Falls Church, VA 22041

# ADDITIONAL REFERENCES

- (c) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Switch Network Management Interface," 26 July 2001
- (d) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Network Management Requirements for End Offices," 2 August 2001
- (e) Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6215.01B, "Policy for Department of Defense Voice Services," 23 September 2001
- (f) Defense Information Systems Agency (DISA), Joint Interoperability and Engineering Organization (JIEO), Technical Report 8249, "Defense Information Systems Network (DISN) Circuit Switched Subsystem, Defense Switched Network (DSN) Generic Switching Center Requirements (GSCR)," March 1997
- (g) Defense Information Systems Agency (DISA) NS53, Memorandum, "DSN Global Network Requirements for Tandem (Standalone), Multifunction, End Office, and Small End Office Switches," 30 January 2003
- (h) Joint Interoperability Test Command, "Defense Switched Network Generic Switch Test Plan (GSTP)," 17 June 1999

1-1 Enclosure 1

# **CERTIFICATION TESTING SUMMARY**

- **1. SYSTEM TITLE**. Avaya MultiVantage S8700 Digital Switching System with Software Release R011x.7585.7.0.2 (hereafter referred to as the system under test [SUT]).
- **2. PROPONENT.** Defense Information Systems Agency (DISA).
- **3. PROGRAM MANAGER.** Mr. Howard Osman, NS53, Room 5W23, 5275 Leesburg Pike, Falls Church, VA 22041, E-mail: Osmanh@ncr.disa.mil.
- **4. TESTERS.** Joint Interoperability Test Command (JITC), Fort Huachuca, AZ.
- 5. SYSTEM UNDER TEST DESCRIPTION. The Avaya Digital Switching System product line in addition to the MultiVantage S8700 includes the DEFINITY G3R and the G3SI. The Avaya DEFINITY G3R and G3SI digital switching systems employs the same software and trunk/line card hardware as the SUT; JITC analysis determined the G3R and G3SI to be functionally identical for interoperability certification purposes. The switching systems and their respective software releases covered under this certification are listed in table 2-1. These two platforms utilize the same software and trunk/line card hardware as the SUT, and were developed to satisfy scalability requirements. The Avaya switch product line offers a Remote Switch Unit (RSU) capability referred to as the Survivable Remote Processor Expansion Port Network. This product line also offers a Voice over Internet Protocol capability. Preliminary testing was performed on these capabilities, but neither is covered by this certification. Avaya's DEFINITY G3R and G3SI digital switching systems are currently in use within the Defense Information Systems Network (DISN) providing Small End Office (SMEO) Switch and Private Branch Exchange (PBX) functionality. If a switch satisfies SMEO criteria, it will satisfy the lesser standards of a PBX.
- **6. OPERATIONAL ARCHITECTURE.** The Generic Switching Center Requirements (GSCR) operational Defense Switched Network (DSN) Architecture is depicted in figure 2-1.

Table 2-1. Certified Avaya DEFINITY Software Releases

Software Release Software Medium Switch Platform							
R011x.7585.7.0.2 (See note) Optical Disk MultiVantage S8700							
R011r.7585.7.0.2 (See note) Optical Disk DEFINITY G3R							
R011i.7585.7.0.2 (See note)	R011i.7585.7.0.2 (See note) PCMCIA DEFINITY G3SI						
Legend: PCMCIA – Personal Computer Memory Card International Association Note: The software is the same: however, Avava distinguishes the different mediums and platforms by the 5 <sup>th</sup> character of the Software Pelease (e.g. v. r. i)							

2-1 Enclosure 2

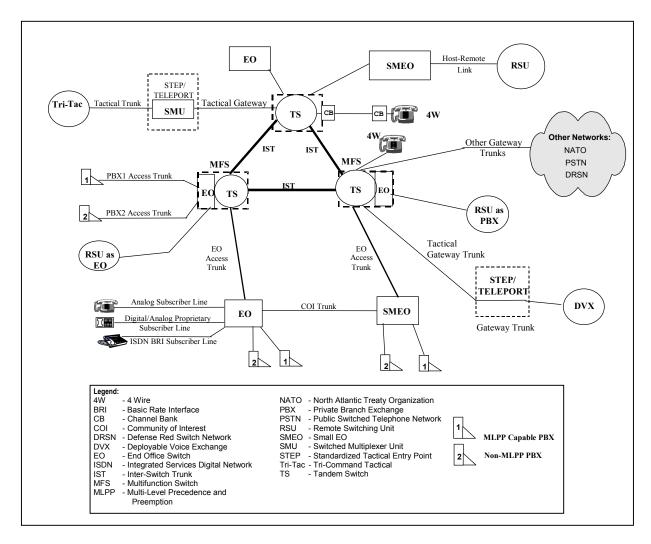


Figure 2-1. DSN Architecture

2-2 Enclosure 2

- **7. REQUIRED SYSTEM INTERFACES.** This interoperability test status is based upon evaluation of the network interfaces as specified in:
- a. The Chairman of the Joint Chiefs of Staff (CJCS) policy for Department of Defense voice services: DSN, Defense Red Switch Network (DRSN) Gateway, Tactical Network Gateway, North Atlantic Treaty Organization (NATO) Gateway, and Commercial Network Gateway.
- b. Interface and signaling requirements for trunk, line, and network management derived from the GSCR document.
- c. Interoperability Exchange Requirements (ERs) and Functional Requirements (FRs) derived from the GSCR.
  - d. The overall system interoperability performance.

The ERs and FRs for the CJCS network interfaces are indicated in table 2-2. The criticality and certification status of these interfaces can be found in paragraph 11. The test summary can be found in paragraph 11b.

Table 2-2. Exchange and Functional Requirements

		Tru	unk Interfaces
	Interface & Signaling	Critical	Exchange and Functional Requirements
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	- MLPP - Hotline Services - System Interface
Defense Switched Network	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	Yes	Non-secure Voice and Data     Secure Voice and Data (STU-III and STE)     NX56 kbps and NX64 kbps Synchronous Data     Non-secure and Secure FAX
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	Yes	VTC     Alarms
	PCM-30 E1 CAS HDB3 MFR1	No	Integrated Services Digital Network     (ISDN PRI only)     Attendant Services <sup>1</sup> System Administration, Measurements, and
	PCM-24 T1 B8ZS/ESF ISDN PRI	Yes	Service Standards - Y2K (Rollover, Valid and Invalid Dates) - Screening, Zone Restriction, and DSN Access Restriction - Automated Message Accounting
	Analog E&M Signaling Type I	No	Network Integration     Common Data Channel (T1 and E1 CAS only)     ANSI T1.619a (T1 ISDN PRI only)

2-3 Enclosure 2

Table 2-2. Exchange and Functional Requirements (continued)

		Li	ne Interfaces		
	Interface & Signaling	Critical	Exchange and Functional Requirements		
	TPC ISDN BRI ST and U Interface Q.931	Yes	- MLPP - Hotline Services - ANSI T1.619a - ISDN Supplemental Services - Call Treatments - DSN Announcements - Attendant Services - EKTS - VTC - NX56 kbps and NX64 kbps Synchronous Data - Non-secure Voice and Data - Secure Voice and Data (STE)		
Defense Switched Network (continued)	TPC 2-Wire analog	Yes	- MLPP - Hotline Services - DSN Announcements - Traffic Measurements - Attendant Services <sup>1</sup> - Call Treatments - Non-secure Voice and Data - Non-secure and Secure FAX - Secure Voice and Data (STU-III and STE)		
	TPC 2-Wire Digital and Analog (Proprietary)	No	- MLPP - Hotline Services - DSN Announcements - Traffic Measurements - Attendant Services <sup>1</sup> - Call Treatments - Non-secure Voice		
	Network Management Interfaces				
	Interface & Signaling	Critical	Exchange and Functional Requirements		
	CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	No	- Automated Message Accounting - Traffic Measurements		
	TPC EIA232 Asynchronous @ 9.6 kbps	No	- Alarms (TCP/IP interface only) - Man Machine Language		
Defense		l	unk Interfaces		
Red	Interface & Signaling	Critical	Exchange and Functional Requirements		
Switch Network Gateway	2-Wire Analog Loop	Yes	- MLPP - Secure Voice		

2-4 Enclosure 2

Table 2-2. Exchange and Functional Requirements (continued)

Tactical Network Gateway		Trunk Interfaces				
Network Gateway		Interface & Signaling	Critical	Exchange and Functional Requirements		
PCM-30 E1 HDB3 CAS MFR1 No - Non-secure Voice    Non-secure Voice	Network		No			
NATO Gateway  Not tested  No See note 2.  Commercial Network Gateway  Interface & Signaling Same Interface Same	Gateway	PCM-30 E1 HDB3 CAS MFR1	No	···=· ·		
Commercial Network Gateway		Analog E&M Signaling Type I	No			
Commercial Network Gateway  Interface & Signaling Same Interfaces and Signaling as DSN  Legend:  10BaseT - Ethernet Based Operation, Twisted Pair All Interface Mark Inversion AMI - Alternate Mark Inversion ANSI - American National Standards Institute B8ZS - Bilpolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling CAT - Category DP - Dial Pulse DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Basic Rate (2.048 Mbps) E3T - Signer Total ENTS - Electronic Key Telephone Service E3T - Secure Terminal Equipment EKTS - Electronic Key Telephone Service EAX - Facsimile  Interface & Signaling Yes  Exchange and Functional Requirements  Mbps - Megabits per second MFR1 - Multi-Frequency R1 MLPP - Multi-Level Precedence and Preemption NATO - North Atlantic Treaty Organization NATO - North Atlantic Treaty Or	NATO	Interface & Signaling	Critical	Exchange and Functional Requirements		
Network Gateway   Same Interfaces and Signaling as DSN   Yes   See note 3.	Gateway	Not tested	No	See note 2.		
Gateway  Same Interfaces and Signaling as DSN  Yes  See note 3.  Legend: 10BaseT - Ethernet Based Operation, Twisted Pair AMI - Alternate Mark Inversion AMI - American National Standards Institute B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling CAT - Category DP - Dial Pulse DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Basic Rate (2.048 Mbps) E3T - ISDN BRI Four-Wire Interface E3M - Ear and Mouth EKT'S - Electronic Key Telephone Service ESF - Extended Superframe FAX - Facsimile  Secure Telephone Unit level 1 (1.544 Mbps)		Interface & Signaling	Critical	Exchange and Functional Requirements		
10BaseT       - Ethernet Based Operation, Twisted Pair       Mbps       - Megabits per second         AMI       - Alternate Mark Inversion       MFRI       - Multi-Frequency R1         ANSI       - American National Standards Institute       MLPP       Multi-Level Precedence and Preemption         B8ZS       - Bipolar Eight Zero Substitution       NATO       - North Atlantic Treaty Organization         BRI       - Basic Rate Interface       NX56       - Data format restricted to multiples of 56K         CAS       - Channel Associated Signaling       NX64       - Data format restricted to multiples of 64K         CAT       - Category       PCM-24       - Pulse Code Modulation 24 Channels         DSN       - Defense Switched Network       PRI       - Primary Rate Interface         DTMF       - Dual Tone Multi-Frequency       SF       - Superframe         E1       - European Basic Rate (2.048 Mbps)       ST       - ISDN BRI Four-Wire Interface         E8M       - Ear and Mouth       STE       - Secure Terminal Equipment         EKTS       - Electronic Key Telephone Service       STU-III       - Secure Telephone Unit III         ESF       - Extended Superframe       SUT       - Digital Transmission Link level 1 (1.544 Mbps)			Yes	See note 3.		
GSCR - Generic Switching Center Requirements TCP/IP - Transmission Control Protocol/Internet Protocol GSTP - Generic Switch Test Plan TPC - Twisted Pair Copper HDB3 - High Density Bipolar Three U - IsDN BRI Two-Wire Interface IEEE - Institute of Electrical and Electronics Engineers, Inc. VTC - Video Teleconferencing ISDN - Integrated Services Digital Network Y2K - Year 2000  Notes:						

**8. TEST NETWORK DESCRIPTION.** The SUT was tested at JITC's Network Engineering and Integration Laboratory in a manner and configuration similar to that of the DSN operational environment. This test was conducted using three test configurations shown in figures 2-2 through 2-4. Testing of the system's required functions and features were conducted using the test configuration depicted in figure 2-2, which accurately emulates the DSN operational environment. Network integration testing, which accurately emulates the DSN operational environment, was conducted using the test configuration depicted in figure 2-3. Figure 2-4 depicts the test configuration used to test the Advanced Defense Switched Network Integrated Management Support System network management required functions and features.

2-5 Enclosure 2

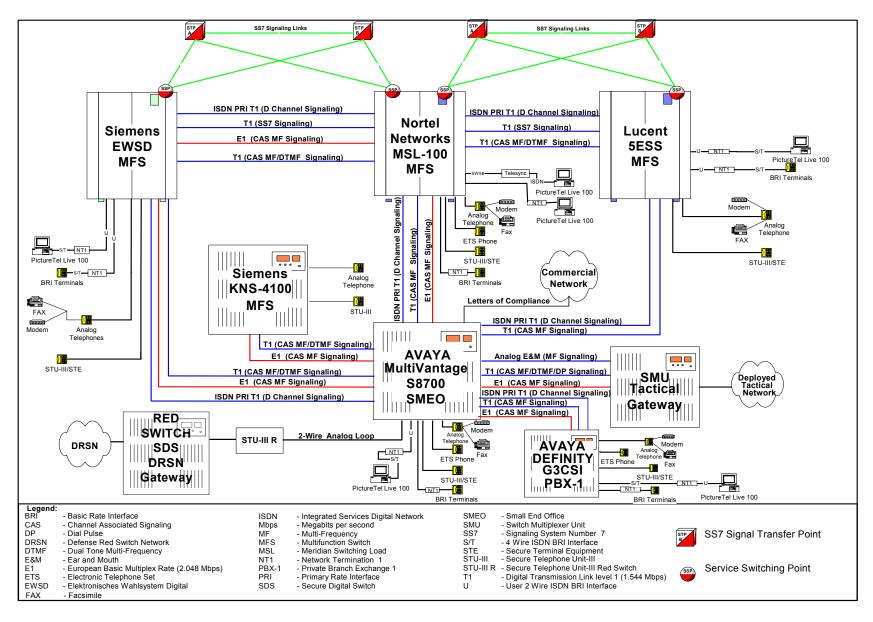


Figure 2-2. Test Configuration

2-6 Enclosure 2

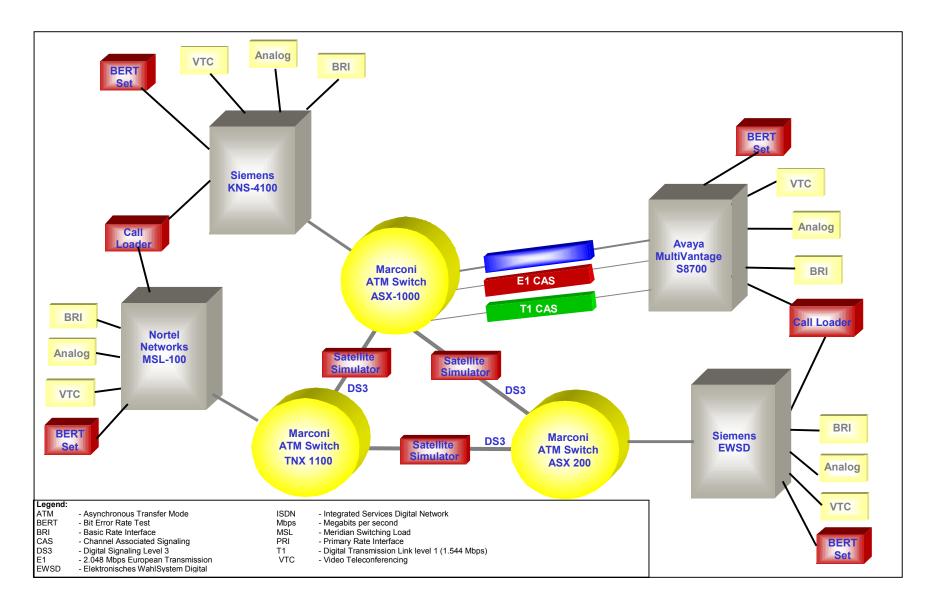


Figure 2-3. Network Integration Test Configuration

2-7 Enclosure 2

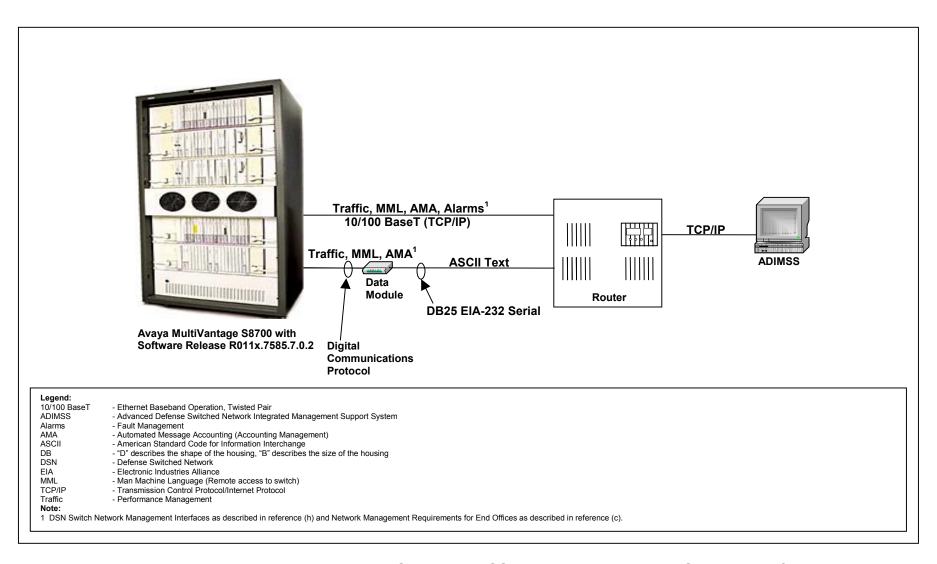


Figure 2-4. Avaya MultiVantage S8700 ADIMSS Network Management System Interface

2-8 Enclosure 2

**9. SYSTEM CONFIGURATIONS.** Table 2-3 provides the system configurations used in the test.

**Table 2-3. Tested System Configurations** 

System Name	Software Release
Nortel Networks MSL-100	MSL-17
Avaya MultiVantage S8700	R011x.7585.7.0.2
Avaya DEFINITY G3R	R011r.7585.7.0.2
Avaya DEFINITY G3SI	R011i.7585.7.0.2
Avaya DEFINITY G3CSI, ProLogix	R011i.7585.7.0.2
Siemens EWSD	19d with Patch Set 32
Siemens KNS-4100	APS4V2.3
Lucent 5ESS	5E15
SMU 96 Tactical Gateway	RD302185
Tekelec STP	23.1
Nortel Networks Broad Band STP	3.0.3.18d
DSS Red Switch	8.03
MARCONI ATM switches	Versions 6.2 and 7.1
Legend:  ATM - Asynchronous Transfer Mode CP - Central Processor DSS - Digital Small Switch EWSD - Elektronisches Wahlsystem Digital MSL - Meridian Switching Load RISC - Reduced Instruction Set Computer SMU - Switch Multiplexer Unit STP - Signal Transfer Point	

# 10. TESTING LIMITATIONS. None

**11. TEST RESULTS.** Tables 2-4 through 2-9 synopsize the SUT interface ER and FR status and criticality. The identified test discrepancies shown below denote only those test discrepancies that remained open after software patches were applied and regression testing was completed. A detailed description of these discrepancies can be found in paragraph 11a.

2-9 Enclosure 2

Table 2-4. Defense Switched Network Trunk Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
		MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
	Attendant Services	No	II-7.2	2.1.3	No	Met <sup>1</sup>	
PCM-24 T1 CAS (B8ZS/ESF) (AMI/SF)  DTMF  Certified	Certified	System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met
		CDC	No	II-24.2	See Note	No	Met <sup>2</sup>

2-10 Enclosure 2

Table 2-4. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
		MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met <sup>1</sup>
PCM-24 T1 CAS		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
(B8ZS/ESF) (AMI/SF) MFR1	Certified	Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met
		CDC	No	II-24.2	See note 2	No	Met <sup>2</sup>

2-11 Enclosure 2

Table 2-4. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
		MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
		Attendant Services	No	II-7.2	2.1.3	No	Met <sup>1</sup>
PCM-24 T1 CAS		System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
(B8ZS/ESF) (AMI/SF) DP	Certified	Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met
		CDC	No	II-24.2	See Note	No	Met <sup>2</sup>

2-12 Enclosure 2

Table 2-4. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
		MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
	Certified	Attendant Services	No	II-7.2	2.1.3	No	Met <sup>1</sup>
PCM-30 E1 CAS HDB3 MFR1		Certified	System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes
WERT		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met
		CDC	No	II-24.2	See Note	No	Met <sup>2</sup>

2-13 Enclosure 2

Table 2-4. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status	
		MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met	
		Hotline Services	No	II-3.2	21.3.10	No	Met	
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met	
		ISDN	No	II-6.2	6.6, 21.1, 21.2, 21.3	Yes	Met	
			Attendant Services	No	II-7.2	2.1.3	No	Met <sup>1</sup>
PCM-24 T1 CCS (B8ZS/ESF) ISDN	Certified	System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met	
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met	
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met	
			AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met	
		ANSI T1.619a	Yes	II-6.2	21.3.1	Yes	Met <sup>3</sup>	

2-14 Enclosure 2

Table 2-4. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
		MLPP	No	II-2.2	2.2.1, 5.3.4.3 through 4.9	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		System Interface (Alarms, non-secure voice and data, secure voice and data, FAX, VTC)	No	II-4.2	10.1 through 10.12	Yes	Met
			Attendant Services	No	II-7.2	2.1.3	No
Analog E&M Signaling Type I	Certified	System Administration, Measurements, and Service Standards	No	II-8.2	9.1 through 9.5	Yes	Met
		Y2K (Rollover, Valid, Invalid) Dates	No	II-9.2, II-10.2, II-11.2	9.1	Yes	Met
		Screening, Zone Restriction, and DSN Access Restriction	No	II-12.2	5.3.4	Yes	Met
		AMA	No	II-14.2	8.1	Yes	Met
		Network Integration	No	II-20.2	10	Yes	Met

2-15 Enclosure 2

# Table 2-4. Defense Switched Network Trunk Interface and Exchange Requirements (continued)

Legen	d:				
AMA	- Automated Message Accounting	E1	- European Basic Multiplex Rate (2.048 Mbps)	Mbps	- Megabits per second
AMI	- Alternate Mark Inversion	E&M	- Ear and Mouth	MFR1	- Multi-Frequency R1
ANSI	- American National Standards Institute	ER	- Exchange Requirements	MLPP	- Multi-Level Precedence and Preemption
B8ZS	- Bipolar Eight Zero Substitution	ESF	- Extended Superframe	PCM	- Pulse Code Modulation
CAS	- Channel Associated Signaling	FAX	- Facsimile	SF	- Superframe
CDC	- Common Data Channel	FR	- Functional Requirements	SUT	- System Under Test
DISN	- Defense Information Systems Network	GSCR	- Generic Switching Center Requirements	T1	- Digital Transmission Link level 1 (1.544 Mbps)
DP	- Dial Pulse	GSTP	- Generic Switch Test Plan	VTC	- Video Teleconferencing
DSN	- Defense Switched Network	HDB3	- High Density Bi-Polar Three	Y2K	- Year 2000
DTMF	- Dual Tone Multiple-Frequency	ISDN	- Integrated Services Digital Network		

- 1 SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C.
  2 CDC is a requirement only for DISN-Europe. Switches that have a requirement to interface to the DSN European KNS-4100 switches must be capable of passing CDC traffic transparently.
  3 The SUT will not allow calls between unlike DSN service domains when resources are available. The SUT meets the minimum requirements defined in reference (g), and full compliance is not required until Oct 2003. The operational impact is minor.

Enclosure 2 2-16

 Table 2-5. Defense Switched Network Line Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
		MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
		ANSI T1.619a	Yes	II-6.2	21.3.1	Yes	Met <sup>1</sup>
TPC,	Cautifical	ISDN Supplemental Services	Yes	II-6.2	21.3	No	Not Met <sup>2</sup>
ISDN BRI ST and U, Q.931	Certified	Attendant Services	No	II-7.2	2.1.3	No	Met <sup>3</sup>
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		DSN Announcements	Yes	II-19.2	5.6	Yes	Met <sup>4</sup>
		Electronic Key Telephone Service	Yes	II-25.5	21.2	No	Met
		MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
2 Wire Analog, TPC	Certified	Attendant Services	No	II-7.2	2.1.3	No	Met <sup>3</sup>
		Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met
		DSN Announcements	Yes	II-19.2	5.6	Yes	Met <sup>4</sup>

2-17 Enclosure 2

Table 2-5. Defense Switched Network Line Interface and Exchange Requirements (continued)

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
		MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
		Hotline Services	No	II-3.2	21.3.10	No	Met
2 Wire Proprietary Digital Certified	Attendant Services	No	II-7.2	2.1.3	No	Met <sup>3</sup>	
	Call Treatments	No	II-15.2	5.2.1.1, 5.2.2.1	Yes	Met	
	DSN Announcements	Yes	II-19.2	5.6	Yes	Met <sup>4</sup>	

### Legend:

ANSI - American National Standards Institute

BRI - Basic Rate Interface

DSN - Defense Switched Network

DISN - Defense Information Systems Network

ER - Exchange Requirements
FR - Functional Requirements

GSCR - Generic Switching Center Requirements GSTP - Generic Switch Test Plan

ISDN - Integrated Services Digital Network

MLPP - Multi-Level Precedence and Preemption

- 4 Wire Integrated Services Digital Network Basic Rate Interface

SUT System Under Test

TPC - Twisted Pair Copper

- 2 Wire Integrated Services Digital Network Basic Rate Interface

- 1 SUT will not allow calls between unlike DSN service domains when resources are available. The SUT meets the minimum requirements defined in reference (g), and full compliance is not required until Oct 2003. The operational impact is
- 2 ISDN Supplemental Services currently not used in the DSN. The operational impact is none.
- 3 SUT meets all the GSCR exchange requirements for attendant services with the following console: Lucent Attendant Console Model 302C.
- 4 Met all critical DSN Announcement requirements except for Isolation Code Announcement. The SUT provides this announcement only for precedence calls above ROUTINE. ROUTINE precedence calls receive a fast busy signal. The operational impact is minor.

Table 2-6. Defense Switched Network Network Management Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
		AMA	No	II-23.2	2.1.10, 16.1	Yes	Met
CAT 5 TPC, IEEE 802.3 10BaseT Ethernet,	Certified	Alarms	No	II-23.2	2.1.10, 16.1	Yes	Met
TCP/IP	Certified	Traffic Measurements	No	II-23.2	2.1.10, 16.1	Yes	Met
		MML	No	II-23.2	2.1.10, 16.1	Yes	Met
	TPC EIA232 Asynchronous @ 9.6 Certified kpbs	AMA	No	II-23.2	2.1.10, 16.1	Yes	Met
Asynchronous @ 9.6		Traffic Measurements	No	II-23.2	2.1.10, 16.1	Yes	Met
		MML	No	II-23.2	2.1.10, 16.1	Yes	Met
		AMA	No	II-23.2	2.1.10, 16.1	No	Not Tested
X.25/BX.25		Alarms	No	II-23.2	2.1.10, 16.1	No	Not Tested
720/13/7.20		Traffic Measurements	No	II-23.2	2.1.10, 16.1	No	Not Tested
Logandi		MML	No	II-23.2	2.1.10, 16.1	No	Not Tested

**Legend:**10BaseT - 10 megabits per second Ethernet twisted pair

 Automated Message Accounting
 Category 5 cable (rated @ 100 megahertz of bandwidth) CAT

- Electronic Industries Alliance ER

Exchange RequirementsFunctional Requirements FR

**GSCR** - Generic Switching Center Requirements

GSTP

 Generic Switch Test Plan
 Institute of Electrical and Electronic Engineering Inc. IEEE

kbps - kilobits per second - Man Machine Language MML

- Twisted Pair Copper - Transmission Control Protocol/Internet Protocol

Table 2-7. Defense Red Switch Network Gateway Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
TPC 2-Wire analog	TPC 2-Wire analog Certified	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
, and the second		Secure Voice (STU-III, STE)	No	NA	2.2.1, 5.3.4	Yes	Met

ER - Exchange Requirements FR - Functional Requirements

GSCR - Generic Switching Center Requirements

- Generic Switch Test Plan GSTP

MLPP - Multi-Level Precedence and Preemption

- Secure Terminal Equipment STE STU-III - Secure Telephone Unit-III

- Twisted Pair Copper

# Table 2-8. Tactical Network Gateway Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
PCM-24 T1 (B8ZS/ESF) (AMI/SF) MFR1, DTMF	0 - 405 - 4	MLPP	No	II-2.2	2.2.1, 5.3.4	Yes	Met
PCM-30 E1 HDB3 CAS	Certified	Non-secure Voice	No	NA	2.2.1. 5.3.4	Yes	Met
Analog E&M Type I		Non-Scoule Voice	140	IVA	2.2.1, 0.0.4	1 63	MICE
AMI - Alternate Mark Inversion							

- Bipolar Eight Zero Substitution B8ZS

CAS - Channel Associated Signaling DTMF - Dual Tone Multi-Frequency

- European Basic Multiplex Rate (2.048 Mbps) E1

E&M - Ear and Mouth ER - Exchange Requirements - Extended Superframe **ESF** 

- Functional Requirements GSCR - Generic Switching Center Requirements

- Generic Switch Test Plan

GSTP - High Density Bipolar Three Mbps - Megabits per second

MFR1 - Multi-Frequency R1 - Multi-Level Precedence and Preemption

PCM-24 - Pulse Code Modulation Twenty-Four channels PCM-30 - Pulse Code Modulation Thirty Channels

- Superframe

- Digital Transmission Link level 1 (1.544 Mbps)

Table 2-9. Commercial Network Gateway Interface and Exchange Requirements

Interface & Signaling	Interface Status	Exchange and Functional Requirements	Test Discrepancies	GSTP Para (s)	GSCR Para (s)	Critical Yes/No	ER/FR Status
Same Interfaces Signaling as DSN	Certified	See Note	No	See Note	See Note	Yes	Met

### Legend: DSN

DSN - Defense Switched Network
ER - Exchange Requirements
FR - Functional Requirements

GSCR - Generic Switching Center Requirements

GSTP - Generic Switch Test Plan

Note: The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP specified in tables 2-1 through 2-15 of the GSCR.

2-21 Enclosure 2

# a. Discussion

- (1) **DSN.** All critical interface ERs and FRs for DSN were met. The following minor exceptions are noted:
- (a) The SUT will not allow calls between unlike DSN service domains when resources are available. The Avaya MultiVantage S8700 meets the minimum requirements defined in reference (d), and full compliance is not required until October 2003. The operational impact is minor.
- (b) The SUT does not support the following unique Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) Supplemental Services as specified in the respective GSCR paragraphs listed below. There are currently no switches in the DISN that support ISDN BRI Supplemental Services. The operational impact is none.
  - Conference Calling. GSCR Para. 21.3.2
  - User-to-User Signaling. GSCR Para. 21.3.3
  - Call Hold. GSCR Para. 21.3.4
  - Call Waiting. GSCR Para. 21.3.5
  - Normal Call Transfer. GSCR Para. 21.3.6
  - Explicit Call Transfer. GSCR Para. 21.3.7
  - ISDN Call Deflection. GSCR Para. 21.3.8
  - Preset Conference Calling. GSCR Para. 21.3.11
- (c) The SUT does not support the Isolation Code Announcement (ICA) for ROUTINE precedence calls. ROUTINE precedence calls receive a fast busy tone rather than the required ICA. The ICA is received by calls above ROUTINE precedence. The operational impact is minor.
- (d) DSN Network Management (NM). The SUT meets all the exchange requirements for NM over Institute of Electrical and Electronic Engineering (IEEE) 802.3 (10BaseT Ethernet) Transmission Control Protocol/Internet Protocol (TCP/IP) and EIA232 asynchronous serial interfaces. It was verified that these interfaces pass required NM data elements per reference (c).
- (e) RSU. The SUT RSU was tested in standalone and non-standalone modes. The RSU, when connected to the SUT Host, is treated similar to a SMEO. The same test procedures conducted on the SUT Host subscribers were also conducted on the RSU subscribers. The RSU did not meet the critical interoperability certification requirements and is, therefore, not certified for joint use in the DISN.
- (2) DRSN Gateway. All critical interface ERs and FRs for the DRSN gateway were met.

2-22 Enclosure 2

- (3) Tactical Gateway. All critical interface ERs and FRs for the tactical gateway were met.
  - (4) NATO Gateway. The NATO Gateway interfaces were not tested.
- (5) Commercial Gateway. The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the Generic Switch Test Plan, specified in tables 2-1 through 2-15 of the GSCR, with minor exceptions. Exceptions were reviewed and assessed by the DISA, Network Services (NS) 53, the Development and Operational Engineering Department, and determined to have a minor operational impact.
- **b. Test Summary.** The Avaya MultiVantage S8700, DEFINITY G3R and G3SI Digital Switching Systems with their associated software releases listed in table 2-1, are certified for joint use in the DISN, in accordance with the requirements set forth in the GSCR. Minor discrepancies identified during testing and the GSCR requirements not tested will have no adverse operational impact. The interoperability summary and status to include criticality for each interface is shown in tables 2-9 and 2-10.
- 12. TEST AND ANALYSIS REPORT. No detailed test report was developed per the Program Manager's request. JITC distributes interoperability information via the JITC Electronic Report Distribution (ERD) system -- ERD uses unclassified (NIPRNET) e-mail. More comprehensive interoperability status information is available via the JITC System Tracking Program (STP). The STP is accessible by .mil/gov users on the NIPRNET at <a href="https://stp.fhu.disa.mil/">https://stp.fhu.disa.mil/</a>. Test reports, lessons learned, and related testing documents and references are on the JITC Joint Interoperability Tool (JIT) at <a href="http://jit.fhu.disa.mil">http://jit.fhu.disa.mil</a> (NIPRNET), or <a href="http://jit.fhu.disa.mil">http://jit.fhu.disa.mil</a> (NIPRNET), or <a href="http://jit.fhu.disa.mil/tssi">http://jit.fhu.disa.mil/tssi</a>.

Table 2-10. Avaya MultiVantage S8700, DEFINITY G3R, and G3SI Digital Switching Systems Interoperability Summary

Network	Status	Remarks
DSN	Certified	- VoIP not certified - Certified as SMEO & PBX1 - RSU not certified - E1 CAS and CDC certified (DISN-E only) - The identified test discrepancies listed in enclosure 2 that remained opened have an overall operational impact of minor.
DRSN Gateway	Certified	
Tactical Gateway	Certified	
NATO Gateway	Not Tested	
Commercial Gateway	Certified	

2-23 Enclosure 2

Table 2-10. Avaya MultiVantage S8700, DEFINITY G3R, and G3SI Digital Switching Systems Interoperability Summary (continued)

Legend: CAS CDC DRSN - Channel Associated Signaling NATO - North Atlantic Treaty Organization Common Data ChannelDefense Red Switch Network PBX1 RSU – Private Branch Exchange 1– Remote Switching Unit DISN-E DSN Defense Information System Network Europe
Defense Switched Network SMEO - Small End Office T1 VoIP - Digital Transmission Link level 1 (1.544 Mbps) - European Basic Rate (2.048 Mbps) Voice over Internet Protocol Mbps Megabits per second

Table 2-11. Interoperability Status

		Trunk Interfaces					
	Interface & Signaling	Critical	Status	Remarks			
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DTMF	Yes	Certified	Met all critical ERs and FRs.			
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	Yes	Certified	Met all critical ERs and FRs.			
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS DP	Yes	Certified	Met all critical ERs and FRs.			
	PCM-30 E1 CAS HDB3 MFR1	Yes	Certified	Met all critical ERs and FRs.			
	PCM-24 T1 (B8ZS/ESF) ISDN PRI	Yes	Certified	Met all critical ERs and FRs. Full compliance to the ANSI T1.619a requirement not met. Derational impact is minor.			
	Analog E&M Signaling Type I	No	Certified	Met all critical ERs and FRs.			
Defense	Line Interfaces						
Switched	Interface & Signaling	Critical	Status	Remarks			
Network	TPC ISDN BRI ST and U Interface Q.931	Yes	Certified	Met all critical ERs and FRs. ISDN Supplemental Services <sup>2</sup> and full compliance of DSN Announcements <sup>3</sup> not met. Operational impact is minor.			
	TPC 2-Wire analog	Yes	Certified	Met all critical ERs and FRs. Full compliance of DSN Announcements <sup>3</sup> not met. Operational impact is minor.			
	TPC 2-Wire Digital (Proprietary)	No	Certified	Met all critical ERs and FRs. Full compliance of DSN Announcements <sup>3</sup> not met. Operational impact is minor.			
	Network Management Interfaces						
	Interface & Signaling	Critical	Status	Remarks			
	CAT 5 TPC IEEE 802.3 10BaseT Ethernet, TCP/IP	Yes	Certified	Met all critical ERs and FRs.			
	TPC EIA232 Asynchronous @ 9.6 kbps	Yes Trunk Int	Certified	Met all critical ERs and FRs.			
Defense Red							
Switch	Interface & Signaling	Critical	Status	Remarks			
Network Gateway	2-Wire Analog Loop	Yes	Certified	Met all critical ERs and FRs.			
Tactical Network Gateway	Trunk Interfaces						
	Interface & Signaling	Critical	Status	Remarks			
	PCM-24 T1 (B8ZS/ESF) (AMI/SF) CAS MFR1	No	Certified	Met all critical ERs and FRs.			
	PCM-30 E1 HDB3 CAS MFR1	No	Certified	Met all critical ERs and FRs.			
,	Analog E&M Signaling Type I	No	Certified	Met all critical ERs and FRs.			

2-24 Enclosure 2

Table 2-11. Interoperability Status (continued)

	Trunk Interfaces							
NATO	Interface & Signaling	Critical	Status	Remarks				
Gateway		No	Not Tested	Operational impact is minor.				
	Trunk Interfaces							
Commercial	Interface & Signaling	Critical	Status	Remarks				
Network Gateway	Same Interfaces and Signaling as DSN	Yes	Certified	See note 4				
Legend:  10BaseT - Ethernet Based Operation, Twisted Pair AMI - Alternate Mark Inversion ANSI - American National Standards Institute B8ZS - Bipolar Eight Zero Substitution BRI - Basic Rate Interface CAS - Channel Associated Signaling CAT - Category DP - Dial Pulse DISN - Defense Information Systems Network DSN - Defense Switched Network DTMF - Dual Tone Multi-Frequency E1 - European Basic Multiplex Rate (2.048 Mbps)		GSTP - Generic Switch Test Plan HDB3 - High Density Bi-polar Three IEEE - Institute of Electrical and Electronic Engineering Inc. ISDN - Integrated Services Digital Network kbps - kilobits per second Mbps - Megabits per second MFR1 - Multi-Frequency R1 NATO - North Atlantic Treaty Organization PCM-24 - Pulse Code Modulation 24 Channels PCM-30 - Pulse Code Modulation 30 Channels PRI - Primary Rate Interface SF - Superframe ST - ISDN BRI Four-Wire Interface						

# GSCR

ΕIΑ

ERs

ESF FRs

Electronic Industries Alliance
 Exchange Requirements
 Extended Superframe

Functional RequirementsGeneric Switching Center Requirements

Notes:

1 The SUT will not allow calls between unlike DSN service domains when resources are available. The SUT meets the minimum requirements defined in reference (g), and full compliance is not required until Oct 2003. The operational impact is minor.

2 ISDN Supplemental Services currently not used in the DISN. The operational impact is minor.

3 Met all DSN Announcement requirements except for Isolation Code Announcement. The SUT provides this announcement only for precedence calls above ROUTINE.

T1

SUT

TCP/IP U

- System Under Test

- Digital Transmission Link level 1 (1.544 Mbps) - Twisted Pair Copper

Transmission Control Protocol/Internet Protocol
 ISDN BRI Two-Wire Interface

- ROUTINE precedence calls receive a fast busy signal.

  4 The certification/compliance of interoperability to commercial networks was satisfied based on the review of the vendor's letter of compliance to requirements identified as the "L" and "V" items listed in appendix E of the GSTP specified in tables 2-1 through 2-15 of the GSCR.

2-25 **Enclosure 2**